

CLAIMS

We claim:

1 1. A process for simultaneously producing a plurality of light-emitting
2 diode light sources of the same kind, each comprising a light-emitting diode chip and a
3 luminescence conversion element, which converts the wavelength of at least part of an
4 electromagnetic radiation emitted by the light-emitting diode chip, wherein the process
5 comprises:

6 providing a layer composite with a light-emitting diode layer sequence applied to
7 a carrier substrate for the plurality of light-emitting diode chips;

8 producing a plurality of trenches in the layer composite,

9 inserting the layer composite into a cavity of a mold,

10 driving a molding compound, containing a luminescence conversion material, into
11 the cavity in such a way that the trenches are at least partly filled with the molding
12 compound,

13 removing the mold, and

14 separating the light-emitting diode light sources from the layer composite.

1 2. A process for simultaneously producing a plurality of light-emitting diode
2 light sources of the same kind, each comprising a light-emitting diode chip and a
3 luminescence conversion element, which converts the wavelength of at least part of an
4 electromagnetic radiation emitted by the light-emitting diode chip, wherein the process
5 comprises:

6 providing a plurality of light-emitting diode chips, which are applied to a common
7 carrier in a regular arrangement;

8 inserting the light-emitting diode chips into a cavity of a mold,

9 driving a molding compound, containing a luminescence conversion material, into
10 the cavity in such a way that free space of the cavity is at least partly filled with the
11 molding compound,

12 removing the mold, and

13 separating the light-emitting diode light sources.

1 3. The process as claimed in claim 1, in which the layer composite is a wafer
2 composite of light-emitting diode chips.

1 4. The process as claimed in claim 1, in which the trenches are formed along
2 dividing lines between regions of adjacent light-emitting diode chips in the layer
3 composite.

1 5. The process as claimed in claim 1, in which the trenches are produced by
2 sawing.

1 6. The process as claimed in claims 1, in which the inner walls of at least
2 some of the trenches are formed in such a way that parts of the bottom surfaces do not
3 run parallel with, and/or parts of the side walls do not run at right angles to, front or rear
4 surfaces of the light-emitting diode chips.

1 7. The process as claimed in claim 1, in which bottom surfaces of at least
2 some of the trenches are formed so as to be V-shaped, convex, concave or stepped,
3 and at least part of the light is coupled out of the light-emitting diode chips via the
4 bottom surfaces of the trenches.

1 8. The process as claimed in claim 2, in which the carrier is flexible.

1 9. The process as claimed in claim 2, in which side flanks of at least some
2 light-emitting diode chips are formed in such a way that parts of them do not run at right
3 angles to front or rear surface of the light-emitting diode chips.

1 10. The process as claimed in claim 2, in which the side flanks of at least
2 some of the light-emitting diode chips are formed in such a way that parts of them run
3 obliquely with respect to the perpendicular to front or rear surfaces of the light-emitting
4 diode chips, curved or stepped.

1 11. The process as claimed in claim 1 or 2, in which the molding compound is
2 a transfer molding compound and the mold is a transfer mold.

1 12. The process as claimed in claim 1 or 2, in which the light-emitting diode
2 chips and/or the light-emitting diode light sources are separated by sawing.

1 13. The process as claimed in claim 1 or 2, in which the cavity is formed in
2 such a way that the inner walls of the mold rest on the front and the rear of the layer
3 composite respectively the chips.

1 14. The process as claimed in claim 1 or 2, in which the layer composite
2 is inserted into the cavity in such a way that it rests with the rear on the inner wall of the
3 mold.

1 15. The process as claimed in claim 1 or 2, in which the layer composite
2 has electrical contact areas on the front side, to which, before the insertion of the layer
3 composite into the cavity, an electrical connecting material with an approximately
4 constant height is applied.

1 16. The process as claimed in claim 1 or 2, in which molding compound by
2 which electrical contacts are covered is removed by thinning, at least until the electrical
3 connecting material is exposed.

1 17. The process as claimed in claim 15, in which molding compound applied
2 to the front is thinned at least until covered electrical connecting material is exposed,
3 and in which the color locus (CIE color chart) of the light-emitting diode light sources is
4 measured repeatedly and thus set specifically by means of further thinning.

1 18. The process as claimed in claim 1 or 2, in which electrical contact areas of
2 the layer composite or of the light-emitting diode chips are sealed off before they are
3 inserted into the cavity and exposed again before being separated.

1 19. The process as claimed in claim 18, in which the electrical contact areas
2 are sealed off by means of films, which are applied to the front and/or rear surface of
3 the layer composite respectively the light-emitting diode chips.

1 20. The process as claimed in claim 18, in which the electrical contact areas
2 of the chips are sealed off by a front and/or rear inner wall of the mold, which comprises
3 part plates fitted such that they can move, which are pressed individually against the
4 front and/or rear of the layer composite or the light-emitting diode chips.

1 21. The process as claimed in claim 1 or 2, in which the position and color
2 locus of the light-emitting diode light sources are subsequently determined and
3 registered and the light-emitting diode light sources are subsequently sorted in
4 accordance with their color locus.

1 22. A component comprising at least one light-emitting diode light source
2 which is produced in accordance with one of the processes as claimed in claim 1 or 2,
3 in which the light-emitting diode light sources are mounted on a leadframe and
4 subsequently encapsulated in a translucent or transparent material.

1 23. A component comprising at least one light-emitting diode light source
2 which is produced in accordance with one of the processes as claimed in claim 1 or 2,
3 in which the light-emitting diode light sources are mounted on a pre-housed leadframe
4 and covered with a translucent or transparent potting compound.
5

1 24. The process as claimed in claim 1 or 2, in which the light-emitting diode
2 chips are inserted into the cavity in such a way that they rest with the rear on the inner
3 wall of the mold.
4

1 25. The process as claimed in claim 1 or 2, in which the light-emitting diode
2 chips have electrical contact areas on the front side, to which, before the insertion of the
3 layer composite or the light-emitting diode chips into the cavity, an electrical connecting
4 material with an approximately constant height is applied.